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BONE MARROW IN TULARAEMIA¹

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Bone marrow in animals dead of tularaemia has been under observation in our laboratory since May 11, 1929, during which time we have studied the marrow of the femur in the following animals infected in the laboratory: Blacktailed jackrabbit, *Lepus*; Cottontail rabbit, *Sylvilagus floridanus*; Belgian hare, *Oryctolagus cuniculus* (domesticated); Guinea pig, *Cavia cobaya*; California ground squirrel, *Otospermophilus grammurus beecheyi*; Cotton rat, *Sigmodon hispidus*.

The present article does not consider the lesions of tularaemia in organs other than marrow except for an occasional reference for purposes of comparison.

¹ From the National Institute of Health, Washington, D.C.

TABLE 1.—The bone-marrow lesions of tularemia in 5 species of rodents

| Num- ber of animal | Date of death | Length of life (days) | Gross appearance of the marrow of femur | Smear of marrow of femur | Microscopic lesions of marrow | Bacteria in sections of marrow |
|--|---------------|-----------------------------|--|-----------------------------|----------------------------------|---|
| LOT 1—BLACK-TAILED JACKRABBITS FROM KANSAS, INOCULATED MAY 27, 1930, SUBCUTANEOUSLY ON ABDOMEN WITH B. TULARENSE CULTURE R.R.P. | | | | | | |
| 668 | May 30, 1930 | 3 | Red, few small nodules | | Scattered foci of necrosis | Clumps of coccoid organisms. |
| 669 | May 31, 1930 | 4 | Studded with small nodules | | Numerous foci of necrosis | Few organisms. |
| 670 | do. | 4 | Thickly studded with nodules | | Multiple foci of necrosis | Great numbers coccobacillary organisms. |
| 671 | do. | 4 | Very red and soft | | Many small foci of necrosis | Numerous coccoid organisms. |
| 672 | June 1, 1930 | 5 | Red, soft, and very spotted | | Numerous small foci of necrosis | Myriads minute coccoid organisms. |
| 673 | do. | 5 | Very red and soft | | do. | Myriads coccobacillary organisms. |
| 674 | do. | 5 | Red, soft, spotted | | Multiple foci of necrosis | Clumps of coccoid organisms. |
| LOT 2—DOMESTICATED RABBITS INOCULATED MAY 27, 1930, SUBCUTANEOUSLY ON THE ABDOMEN WITH B. TULARENSE CULTURE R.R.P. | | | | | | |
| 675 | June 2, 1930 | 6 | Firm and spotted | No bacteria identified | Scattered foci of necrosis | No organisms identified. |
| 679 | June 3, 1930 | 7 | Firm, pink, and spotted | do. | Numerous focal necroses | Do. |
| 680 | do. | 7 | do. | do. | Multiple foci of necrosis | Do. |
| 681 | do. | 7 | Firm, pink, few spots | do. | Occasional small nodule | Do. |
| 682 | do. | 7 | do. | do. | Few scattered nodules | Do. |
| LOT 3—GUINEA PIGS INOCULATED FROM LOT 1 OF BLACK-TAILED JACKRABBITS AT TIME OF DEATH MAY 30 TO JUNE 1, 1930 | | | | | | |
| 678 | June 2, 1930 | 6 | Few spots | No bacteria identified | Scattered nodules | Scattered clumps coccoid organisms. |
| 680 | June 5, 1930 | 4 | Pink, firm, no spots | do. | Few focal lesions | No organisms identified. |
| 691 | do. | 5 | do. | do. | 1 small focal necrosis | Do. |
| 692 | do. | 5 | No gross lesions | do. | 2 small focal necroses | Do. |
| 693 | do. | 5 | do. | do. | Several focal necroses | Small clumps coccoid organisms. |
| 694 | do. | 5 | Pink, firm, no gross lesions | do. | Occasional small nodule | No organisms identified. |
| 695 | do. | 6 | do. | do. | Scattered small foci of necrosis | Small clumps coccoid organisms. |
| 696 | June 6, 1930 | 6 | do. | Few B. tularense | Numerous small foci of necrosis | Numerous clumps coccoid organisms. |
| 697 | June 7, 1930 | 5 | do. | No bacteria identified | 4 focal necroses | Few clumps coccobacillary organisms. |
| 698 | June 8, 1930 | 7 | do. | do. | Many scattered focal necroses | |

LOT 4—DOMESTICATED RABBITS INOCULATED FEB. 4, 1930, SUBCUTANEOUSLY ON THE ABDOMEN WITH B. TULARENSE CULTURE R.R.P.

| | | | | | | | |
|-----|---------------|---|----------------------------|--------|---|-------------------------|-------------------------|
| 000 | Feb. 7, 1930 | 3 | Very spotted (photo 48267) | A.M.M. | ----- | ----- | No bacteria identified. |
| 440 | Feb. 8, 1930 | 4 | Very spotted (photo 48268) | A.M.M. | (Spleen, A.M.M. 48266; liver, A.M.M. 48265.) | Multiple focal necroses | Do. |
| 446 | Feb. 10, 1930 | 6 | Spotted | ----- | ----- | Numerous focal necroses | Do. |

LOT 5—DOMESTICATED RABBITS WERE INOCULATED JUNE 28, 1929, ON THE NORMAL SKIN OF SACRAL REGION WITH B. TULARENSE CULTURE FL SPU.

| | | | | | | | |
|-----|--------------|---|----------------------|-------|-------|--------------------------|--|
| 196 | July 3, 1929 | 5 | ----- | ----- | ----- | Scattered focal necroses | No bacteria identified. |
| 197 | July 4, 1929 | 6 | Studded with nodules | ----- | ----- | Numerous focal necroses | Small clumps coccobacillary organisms. |
| 199 | July 6, 1929 | 8 | do | ----- | ----- | do | Do. |

LOT 6—WILD COTTONTAIL RABBITS FROM MARYLAND WERE INOCULATED MAY 6, 1929, ON THE NORMAL SKIN OF SACRAL REGION WITH B. TULARENSE CULTURE FL SPU.

| | | | | | | | |
|-----|--------------|---|----------------------------|-------|-------|-----------------------------|------------------------------------|
| 156 | May 11, 1929 | 5 | ----- | ----- | ----- | Many small foci of necrosis | Numerous coccobacillary organisms. |
| 159 | do | 5 | Studded with small nodules | ----- | ----- | Numerous focal necroses | Do. |

LOT 7—WILD COTTONTAIL RABBITS FROM VIRGINIA WERE INOCULATED NOV. 14, 1930, ON THE NORMAL SKIN BETWEEN THE SHOULDERS WITH A MIXED SUSPENSION OF B. TULARENSE R.R.P., CAN. AND JEL.

| | | | | | | | |
|-----|---------------|---|--------------------|-------|--------------------------|-----------------------|------------------------------|
| 597 | Nov. 20, 1930 | 6 | Red, soft, spotted | ----- | Myriads of coccoid forms | Many foci of necrosis | Clumps of coccoid organisms. |
|-----|---------------|---|--------------------|-------|--------------------------|-----------------------|------------------------------|

LOT 8—CALIFORNIA GROUND SQUIRRELS WERE INOCULATED AS INDICATED

| | | | | | | | |
|------|---------------|----|----------------------------|-------|-------------------|-------------------------------|------------------------------------|
| 3120 | Mar. 11, 1933 | 5 | Studded with small nodules | ----- | Many B. tularense | ----- | Method of inoculation: |
| 3123 | Mar. 12, 1933 | 6 | do | ----- | Few B. tularense | Studded with foci of necrosis | Rubbed on abdomen with Omo spleen. |
| 3166 | Mar. 20, 1933 | 14 | Seemed to show few nodules | ----- | No bacteria seen | Multiple foci of necrosis | Do. |
| 3242 | Apr. 7, 1933 | 32 | Soft, red, no nodules | ----- | do | No focal lesions | Rubbed on abdomen with Da spleen. |
| 3296 | Apr. 25, 1933 | 7 | Studded with small nodules | ----- | do | Multiple foci of necrosis | Do. |
| 3299 | Apr. 27, 1933 | 9 | Seemed to show nodules | ----- | do | ----- | Fed with Omo spleens and livers. |

EXPLANATION OF TABLE 1

Table 1 (lots 1 and 2) places in marked contrast the bone-marrow lesions produced in two species of rabbit. Black-tailed jack rabbits (lot 1) showed a soft, red, very spotted bacteria-laden marrow while the domesticated rabbits (lot 2) showed a firm pink almost bacteria-free marrow, both lots having been inoculated at the same time with the same culture of *B. tularensis* (R.R.P.).

Guinea pigs (lot 3), although they were inoculated from the highly virulent tissues of lot 1 black-tailed jack rabbits, showed firm, pink, almost bacteria-free marrow like that of the domesticated rabbits. Histologically the guinea-pig marrow showed lesions which were not grossly visible.

Lot 4 of domesticated rabbits furnished the specimens for photographs of the gross lesions of marrow and spleen (plate I).

Lots 6 and 7 show the marrow-lesions in the wild cottontail rabbits caught in Maryland and Virginia and infected in the laboratory.

Lot 8 presents the bone-marrow lesions produced in California ground squirrels caught in nature in California and shipped to Washington, D.C., where they were inoculated with tularaemia. Four were inoculated with the highly virulent strain Omo and two with the less virulent strain Da.

SURVIVAL OF *B. TULARENSE* IN THE MARROW OF REFRIGERATED RABBITS

Human cases of tularaemia frequently result from skinning and dressing wild rabbits kept in cold storage, particularly if a fragment of shattered bone pierces a finger, as may happen in the case of a market man or in those who skin rabbits for foxes raised for their furs.

Black-tailed jack rabbits (table 1, nos. 672, 673, and 674) were tested for survival of *B. tularensis* in the bone marrow of the femur by placing the entire hind leg at time of death at a temperature of 3° C. for 1 month, at the end of which time the marrow was injected into guinea pigs and caused their death in 5 to 8 days with typical lesions of tularaemia—caseous inguinal lymph nodes and focal necroses of spleen and liver.

Wild cottontail rabbit no. 897 (table 1) and nine other cottontail rabbits were found to harbor virulent *B. tularensis* in their marrow, some after 3 months and others after 4 months of refrigeration at 3° C.

One domesticated rabbit refrigerated 5 months at 3° C. and another domesticated rabbit frozen 8 months at a temperature of -15° C. still harbored virulent *B. tularensis* in their marrow at the end of the times indicated.

The gross lesions of tularaemia were plainly evident in the marrow at the end of refrigeration as were also coccoid and bacillary forms of *B. tularensis* in smears of the marrow.

PATHOLOGY

The only report of focal lesions in the bone marrow in the literature is that of Yamaguchi (1931), who stated that nodules were formed also in the adrenal cortex and bone marrow and showed distinct caseation. His report refers to experimentally infected guinea pigs dying between 5 and 15 days after inoculation.

In man, bone marrow has been examined only in three cases. Goodpasture and House (1928) noted the bone marrow of the femur and ribs as abundant and pink, grossly, but failed to include a histologic description. Bunker and Smith (1928) did not mention bone marrow in their report, but the senior author obtained a piece of rib from this case and could demonstrate no focal lesions in the red marrow. In a case (J.H.) of McKelvy's autopsied by Musser in November 1932 (personal communication), no focal lesions were seen in the bone marrow.

DOMESTIC RABBITS (*Oryctolagus cuniculus*)

Femoral bone marrow from 58 rabbits was available for histologic study. In 21 the fatal infection followed a single inoculation; in the remaining 37, 2 to 5 inoculations with living cultures of *B. tularensis* preceded the fatal outcome. In 14 of the first group, survival was 7 days or less, and the lesions in the organs were of acute type, while the lesion type was generally acute only in 6 of the 37 which received multiple inoculations.

Grossly the marrow was noted as pink and firm and usually contained more or less numerous small, gray-white foci of necrosis (figs. 2, 3). These were absent grossly in 3 of the 21 animals infected by a single inoculation and, in 2 of these, foci were demonstrable histologically. The third, in which marrow lesions were absent, died after 66 days of subacute pulmonary tularaemia and the bone marrow was not infectious for guinea pigs. In the 37 animals which received multiple inoculations, focal necroses in the bone marrow were definitely recognizable grossly in 21, indefinite in 3, present histologically in all the foregoing and 7 more, and absent both grossly and histologically in 6. In these last the general infection was subacute in lesion type, and the interval of survival from the last inoculation was from 3 to 5 weeks, with one exception, an animal dying with definitely subacute lesions 4 days after his third inoculation. The interval from the second inoculation to death was 32 days, and it appears more probable that this was the fatal infection.

Histologically the lesions first appear as rounded foci of coagulative necrosis in which necrotic, but still distinctly granular, myelocytes (fig. 5) with pyknotic, lytic, or fragmenting nuclei, are imbedded in oxyphil granular and fibrillar material which failed to stain by Weigert's fibrin method. Marginal exudative or proliferative reaction is absent. These are the findings in animals dead on the third day after their first inoculation. The coagulated cells soon break down to amorphous granular debris (fig. 6), especially centrally; fibrillar material remains evident peripherally for some time. After a time vacuolated epithelioid cells appear peripherally (fig. 7) and may replace the caseous foci. Such granulomatous foci appeared in animals dying 7, 16, and 28 days after single inoculation and more frequently after multiple injections. However, focal necroses without marginal reaction are still frequently the only type seen, or constitute part of the lesions present, even in cases in which lesions in other viscera are definitely of the proliferative subacute type (table 2).

TABLE 2.—*Type of bone-marrow lesions in rabbits in acute and subacute tularaemia*

| Classification of case on basis of other lesions | Single inoculations | | | | Multiple inoculations | | | | Total | | | |
|--|---------------------|-------------|------------|-------|-----------------------|-------------|------------|-------|----------------|-------------|------------|-------|
| | Focal necroses | Granulomata | No lesions | Total | Focal necroses | Granulomata | No lesions | Total | Focal necroses | Granulomata | No lesions | Total |
| Acute..... | 13 | 1 | 0 | 14 | 5 | 1 | 0 | 6 | 18 | 2 | 0 | 20 |
| Subacute..... | 4 | 2 | 1 | 7 | 12 | 13 | 6 | 31 | 16 | 15 | 7 | 38 |
| All cases..... | 17 | 3 | 1 | 21 | 17 | 14 | 6 | 37 | 34 | 17 | 7 | 58 |

Aside from the focal lesions, the marrow ordinarily contains few polymorphonuclear leucocytes or metamyelocytes. Myeloblasts are sometimes increased in numbers at the expense of the granular myelocytes, particularly in acute cases following single inoculations. Nodules of lymphoid cells often appear, especially in subacute cases following multiple inoculations. A more or less marked interstitial serous exudation (fig. 8) with or without congestion and hemorrhage, often appears, with material reduction in the cellularity and obliteration of the fat content of the marrow. This change is noted especially after multiple injections in both acute and subacute cases, and in late acute and subacute stages after single inoculations. Occasionally foci of interstitial fibrin deposition accompany this exudation. Scattered necrotic and karyorrhectic marrow cells throughout the marrow were associated with fibrinocaseous focal necroses in two instances.

GUINEA PIGS (*Cavia cobaya*)

Femoral bone marrow was studied grossly and histologically in 20 guinea pigs. Focal lesions were recognized grossly only in two as small grayish white nodules in the usually scanty, firm, pink



FIGURE 1.—Spleen of domesticated rabbit 440, dead fourth day, showing focal necrosis. A.M.M. 48266.

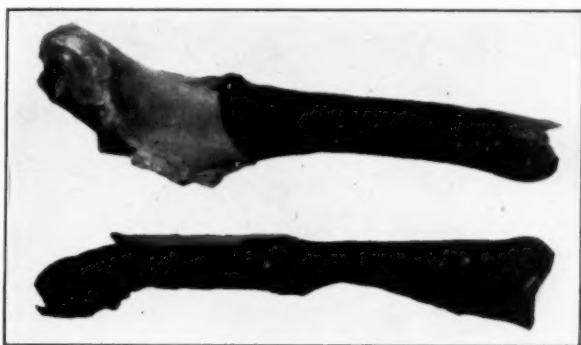


FIGURE 2.—Marrow of femurs of domesticated rabbit 440, dead fourth day, showing focal necrosis. A.M.M. 48268.



FIGURE 3.—Marrow of femurs of domesticated rabbit 600, dead third day, showing focal necrosis. A.M.M. 48267.

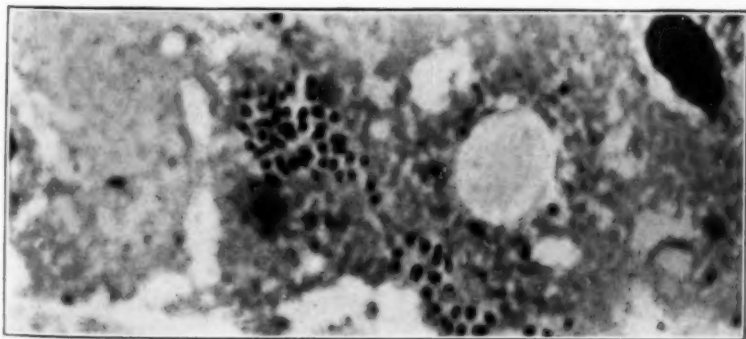


FIGURE 4.—*Bacterium tularensis* in smear of marrow of femur of black-tailed jackrabbit 672, dead fifth day. A.M.M. 48555.

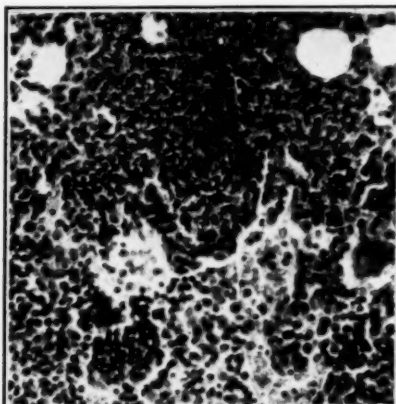


FIG. 5

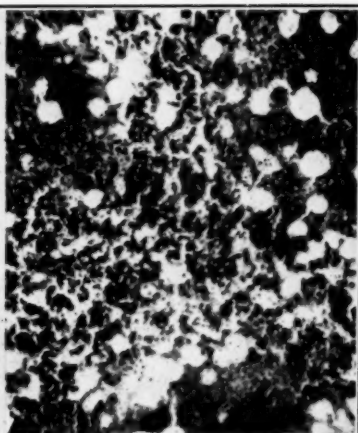


FIG. 6

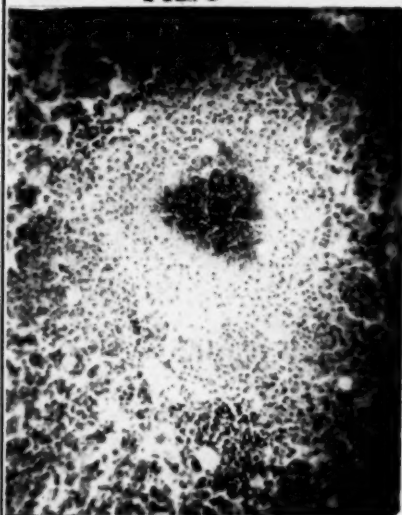


FIG. 7

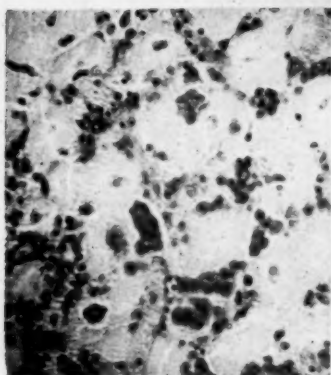


FIG. 8

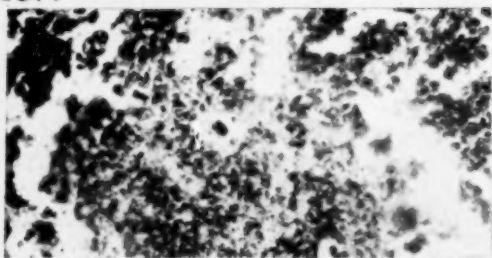


FIG. 9

FIGURE 5.—Focal coagulative necrosis, bone marrow, rabbit, 3 days. $\times 280$.
 FIGURE 6.—Focal necrosis, bone marrow, rabbit, 4 days. $\times 145$.
 FIGURE 7.—Caseating granuloma, bone marrow, rabbit. Subacute tularaemia. $\times 145$.
 FIGURE 8.—Oedematous bone marrow in subacute tularaemia, rabbit. $\times 280$.
 FIGURE 9.—Focal necrosis, bone marrow, guinea pig, 6 days. $\times 280$. (All photographs reduced approximately $\frac{1}{3}$ from the magnifications indicated.)

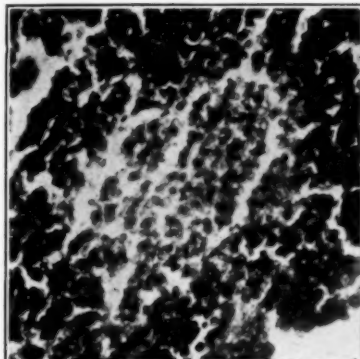


FIG. 10

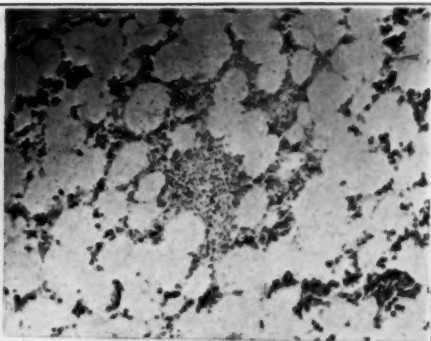


FIG. 11

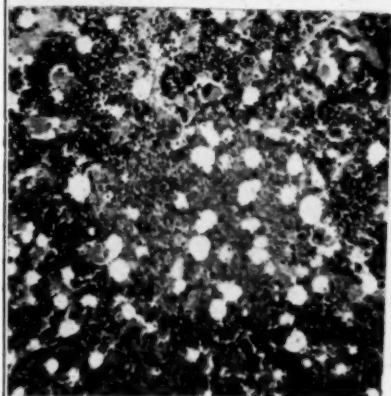


FIG. 12

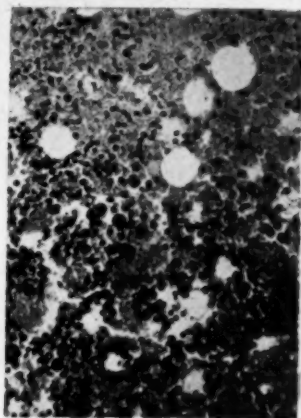


FIG. 13

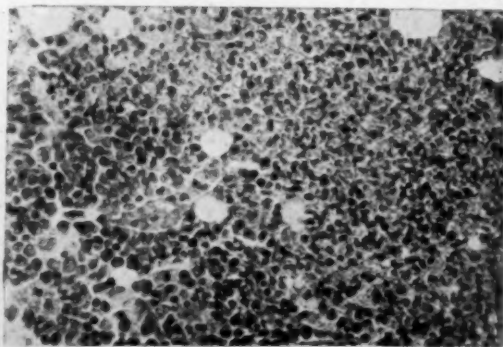
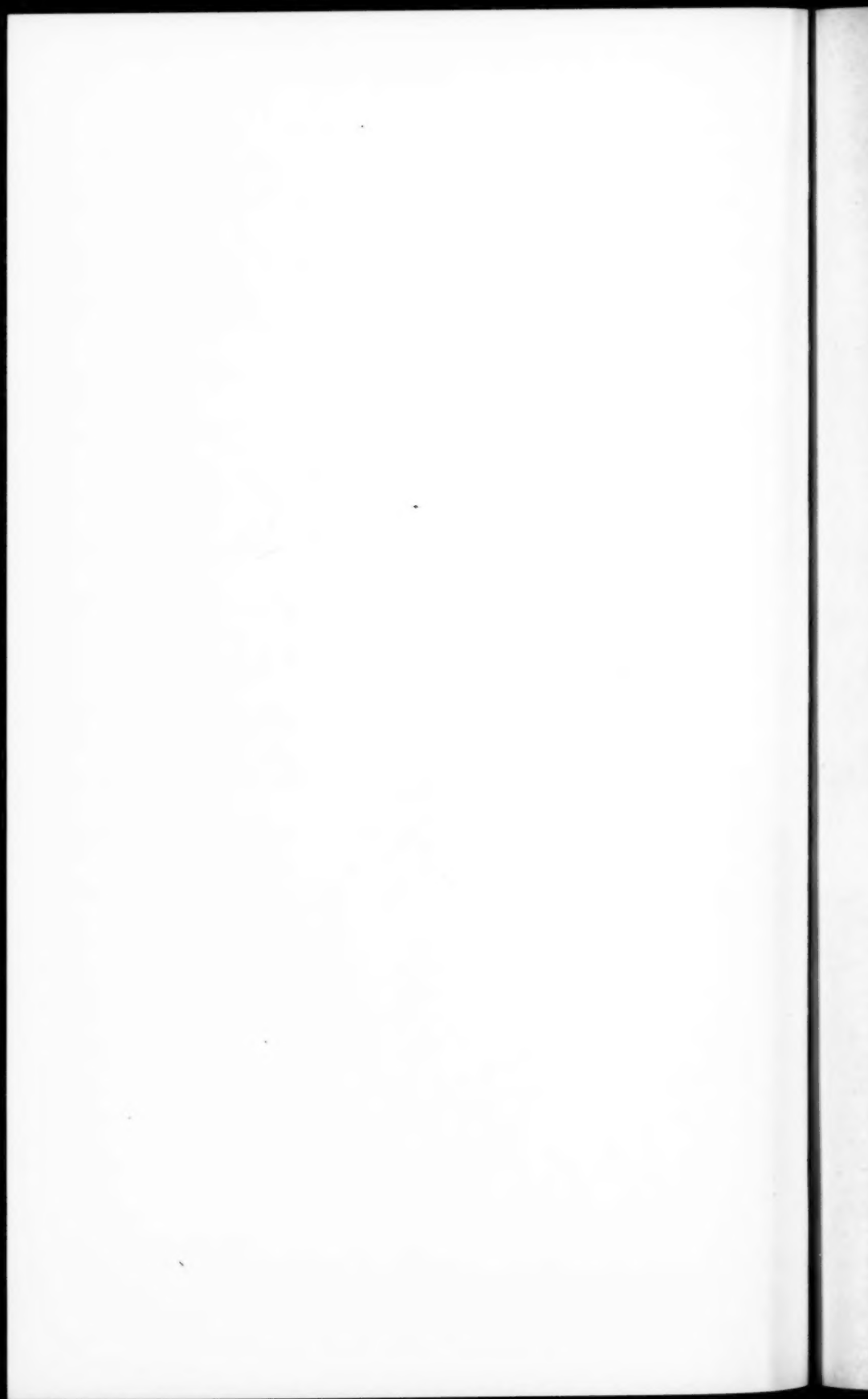


FIG. 14

FIGURE 10.—Small granuloma, bone marrow, guinea pig, 5 days. $\times 280$.
FIGURE 11.—Focal necrosis, bone marrow, cottontail rabbit. $\times 150$.
FIGURE 12.—Focal necrosis, bone marrow, black-tailed rabbit, 3 days. $\times 145$.
FIGURE 13.—Margin of focal necrosis, bone marrow, black-tailed jackrabbit, 3 days. $\times 280$.
FIGURE 14.—Margin of focal necrosis, bone marrow, California ground squirrel, 6 days. $\times 280$. (All photographs reduced approximately $\frac{1}{3}$ from the magnifications indicated.)



marrow. Smears were made in 10, and only 1 (dying in 6 days) showed very few coccoid organisms.

Histologically, focal necroses were present in 18 animals, varying in number from 1 or 2 to numerous, usually designated as few, occasional, or scattered, being numerous only in 2 guinea pigs (dying in 6 and 7 days). They were absent in a guinea pig dead 4 weeks after inoculation and in 1 dead 10 days after the last of 3 successive inoculations with cultures of increasing virulence spread over a period of 3 months. Their size was usually 0.1 to 0.2 mm, occasionally 0.3 mm in diameter. Two general types are discerned. In one type are foci with contents of nuclear and granular oxyphil debris in which intact and fragmenting leucocytes are sometimes seen (3 of 11 animals) and in which no marginal proliferation is present (fig. 9). Coagulated rounded marrow cells persisted in the lesions in two of these animals. This type was seen in 11 animals dying after 5, 5, 5, 5, 6, 6, 6, 7, 17, and 23 days. In the second type the lesions were composed of highly vacuolated epithelioid cells with karyolytic nuclei infiltrated by or surrounding central masses of nuclear and cellular debris, with recognizable intact or fragmenting leucocytes in 2 animals (5 days) (fig. 10). In two animals with this type of lesion there were also some of the first type without marginal proliferation. This granulomatoid type occurred in 7 guinea pigs dying after 4, 5, 5, 5, 5, 6, and 19 days. The granulomatoid type of lesion was less often seen in the bone marrow than in the spleens of the same animals. Scattered and clumped coccoid and coccobacillary organisms were identified in the lesions in 6 of 14 guinea pigs in which search was made.

Organisms were demonstrated outside of the focal lesions only in one guinea pig (dying in 6 days), where they occurred in scattered clumps in littoral cells, tissue spaces, and hyaline thrombi. Occasional hyaline thrombi without organisms were seen in one other animal (dying in 4 days). Granular myelocytes were often much reduced in numbers, being replaced by nongranular promyelocytes. Polymorphonuclear leucocytes were usually few in numbers, being increased in some of the animals in which leucocytes participated considerably in the focal lesions, and were more numerous in the two animals showing no focal lesions.

COTTONTAIL RABBITS (*Sylvilagus floridanus*)

Marrow from the femur was examined in nine cottontail rabbits infected in 1929 and 1930. It was generally soft or almost diffuent, red, and more or less thickly studded with fine white foci of necrosis. Smears showed myriads of coccoid forms of *B. tularensis*.

As six of these rabbits were kept in cold storage for some months before being autopsied in the course of the study of the survival of

the organisms in storage, material for histologic examination was saved only in the other three. These had died in 5, 5, and 6 days.

Histologically, the marrow was congested, contained many small hyaline thrombi, showed much diffuse cell degeneration and karyorrhesis, and was thickly studded with small foci (0.2 mm) of recent caseous necrosis filled with nuclear and cellular debris and showing no marginal exudative or proliferative reaction (fig. 11). There was an increase in promyeloid and lymphoid cells at the expense of the myelocytes, and polymorphonuclears were rare. Coccoid and coccobacillary organisms were very numerous, occurring in necrotic foci, in hyaline thrombi, in littoral cells, and in one rabbit diffusely in the tissue spaces. In one they were noted as fewer in necrotic foci.

It was in this species that we first encountered lesions of the bone marrow on May 11, 1929.

COTTON RATS (*Sigmodon hispidus*)

While the bone marrow was not studied grossly in cotton rats, marrow was encountered in the thyroid bone of 2 dying on the seventh day and in 1 a focus of recent caseating karyorrhetic necrosis without marginal reaction was found. There was a clump of small coccoid organisms in the margin of the lesion. In the other cotton rat the marrow showed karyolysis and some karyorrhesis, but no definite focal necroses and no organisms.

BLACK-TAILED JACKRABBITS (*Lepus* sp.)

The bone marrow of the femur was studied in all of the seven black-tailed jackrabbits infected with tularaemia. Of these, 1 (puerpera) died in 3 days, 3 in 4 days, and 3 in 5 days. Grossly, the marrow was red and soft. In 2 animals focal necroses were not grossly evident, in 4 they were seen as numerous fine white points, and in 1 (3 days) spots were few and the marrow was relatively firm.

Smears of the marrow were made in 5 of the 7 jackrabbits, and in all myriads of *B. tularensis* were present.

Histologically, the marrow was generally of a mixed cellular and fatty type, and moderate to marked congestion was present. Pseudo-eosinophil myelocytes were the predominant cell type and showed variable grades of cell degeneration in different animals, cell vacuolation, loss of pseudo-eosinophil granulation, karyorrhesis, irregular nuclear lobulation, and nuclear pyknosis being the principal changes observed. Numbers of normoblasts and pyknotic megakaryocytes were generally present. Moderate numbers of lymphocytes were seen in some animals. Many small hyaline thrombi were seen in the blood sinuses. Numerous focal necroses about 0.2 to 0.5 mm in diameter were present in all, fewest in the animal which died in 3 days (figs. 12 and 13). In some foci and in some animals coagu-

lated necrotic marrow cells with lytic or fragmenting nuclei formed the focus; in most instances these were replaced by nuclear fragments and granular oxyphil debris. In two animals (5 days) a delicate fibrin meshwork, not stained by Weigert's method, could be discerned either marginally or throughout the necrotic foci. Marginal proliferative reaction and cellular infiltration were absent.

Large numbers of minute coccoid organisms were present in all, clumps occurring in hyaline thrombi, free in the blood and tissue spaces, in reticulum cells, occasionally in megakaryocytes and lymphocytes and in the sheaths of vessels. In the focal necroses, especially centrally, organisms are poorly stained or not demonstrable, when stained, large numbers are demonstrated.

OPOSSUMS (*Didelphys virginiana*)

In the 11 opossums studied by the writers, bone marrow was unfortunately not saved in the 3 dying of acute tularaemia. In 4 others, killed 25 days to 7 weeks after infection, no focal lesions were found in the bone marrow of the femur.

CALIFORNIA GROUND SQUIRRELS (*Otospermophilus grammurus beecheyi*)

Bone marrow was studied in 6 California ground squirrels dying 5, 6, 14, 32, 7, and 9 days after inoculation with virulent cultures.

Grossly, the femoral bone marrow was studded with numerous small white spots in the 3 animals dying in 5 to 7 days, these spots were dubious in the animal which died after 9 days, few at 14 days, and the marrow was normal in the animal which survived 32 days. Smears of the marrow showed numerous *B. tularensis* in 1 animal (dying in 5 days) few in another (dying in 14 days), and none in 2 others (dying in 7 and 9 days after ingestion of virulent organs, 8 weeks after inoculation with a culture of low virulence).

Material for histologic study was prepared in 4 of the above-mentioned animals (dying in 6, 14, 32, and 7 days). In the animal which survived the longest, focal lesions were absent but the marrow was packed with lymphoid or premyeloid cells containing vesicular nuclei and nucleoli, few granular myelocytes, and numerous megakaryocytes. In the other 3 there were multiple foci of necrosis which were conglomerate in the 14-day animal, and miliary in the other 2. They were composed of fragmented nuclei and cell debris, sometimes (6 days) fragmenting leucocytes, in one enmeshed in a close delicate feltwork of fibrin (fig. 14). Marginal proliferation and leucocyte infiltration were absent. In these three animals the marrow was composed chiefly of granular myelocytes. Megakaryocytes were fewest in the 6-day squirrel, more numerous in the others.

SUMMARY

Focal lesions are almost constantly present in the bone marrow in acute tularaemia in the five rodent species in which the marrow was systematically studied. They are frequent also in subacute tularaemia in rabbits and guinea pigs. The marrow focal lesions often become granulomatous in character in subacute tularaemia, but also often remain as simple focal necroses while lesions in other organs are granulomatous. There is a greater tendency to granulomatous reaction in rabbits the subject of repeated inoculation with living cultures of *B. tularensis*; but in some of these in which marked granulomatous reactions were present in the lungs in a few days after the last inoculation, lesions are in all probability assignable to the inoculation made a month or more previously.

Aside from focal lesions there appears to be some destructive action affecting the more mature cell forms of the marrow.

It appears probable that focal lesions may be encountered in the bone marrow of human cases when a more extensive search is made.

Acknowledgment.—We are indebted to Maj. G. R. Callender and to Maj. J. E. Ash, who, as successive curators of the Army Medical Museum, made the four photographs comprising plate I.

NOTE.—We have also found foci of necrosis in the bone marrow of tularaemia-infected ground hogs, *Marmota flaviventris*.

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A NEUROPSYCHIATRIC SERVICE IN A MARINE HOSPITAL

Review of One Year's Work of the Clinic at Ellis Island

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During the past few years, with the decline of immigration, the large number of vacant beds in the Ellis Island Hospital have been used for the care and treatment of regular Public Health Service beneficiaries. This has created a hospital with certain unique features. The opportunities and the demands of such a situation have justified the creation of a rather large neuropsychiatric service. This brief paper is an attempt to evaluate the worth of this service in the operation of this hospital.

The neuropsychiatric service of the United States marine hospital at Ellis Island is administered as an integral part of the hospital organization. Facilities are available for close and for normal supervision

of psychopathic patients, and there are open wards for patients requiring general hospital care. For patients in need of supervision, there are 46 beds, and for others, 50 beds.

The closed wards are of an old type but are quite adequate for purposes of observation and temporary detention. Their arrangement permits segregation of the more disturbed from the quiet, cooperative patients.

Patients admitted for diagnosis and treatment fall into two categories—voluntary patients, and those who can legally be held even though they desire to leave. Patients of the United States Immigration Service, and personnel of the United States Coast Guard are legally subject to detention, while all others are voluntary and must be discharged from hospital if and when discharge is requested. When a psychotic patient not subject to detention requests his discharge, the New York City police are notified and the patient is turned over to them for admission to the psychopathic division of Bellevue Hospital.

Prolonged treatment of chronic psychotic patients is not a function of the Public Health Service. Immigration patients are held until disposed of by that service. When civilian patients have a legal residence, an attempt is made to transfer them to their own States for care. Coast Guard patients and civilians without legal residence are transferred to St. Elizabeths Hospital in Washington, D.C., when it is apparent that prolonged treatment and institutional care are needed.

Nonpsychotic patients in need of prolonged care and treatment remain in the neuropsychiatric service or are transferred to the chronic ward of the hospital. As a result, there is a certain "clogging" and slowing up in the turn-over. However, this situation is identical with that encountered in all marine hospital work. Merchant seamen very frequently have no homes or families able to take care of them and, when incapacitated, must be cared for. In a civilian hospital, of course, these patients are returned to their homes when the maximal results from hospitalization are obtained, or are transferred to hospitals for chronics.

The Public Health Service is very fortunate in having the services of Dr. S. B. Wortis, assistant professor of neurology at New York University, as consultant in neurology. Dr. Wortis visits the hospital at a fixed time each week and holds clinics at which cases are presented and discussed. These clinics are open to the entire staff of the hospital, and are of great value in clarifying the organic aspects of our problems. During the past year, 162 patients have been presented at these clinics.

The volume of neurosurgery has so far not justified the organization of this special service. Patients in need of surgical treatment are transferred to Dr. Foster Kennedy's care at Bellevue Hospital, and

are returned to us for convalescence after the needed surgical work has been done.

A well-equipped library is maintained, periodicals are available, and many charts and models have been acquired.

During the past year an excellent 16-mm motion picture camera has been obtained and a series of motion pictures of neurological and psychiatric conditions is being collected. These are of great value in orienting beginners in the fields of neurology and psychiatry, and in demonstrating the differentiation between organic and "functional" conditions.

The work of keeping proper case histories and of recording findings and opinions is greatly facilitated by the use of a dictaphone. By its use, a permanent record of neurological and psychiatric conferences is kept.

During the past fiscal year, from July 1, 1932, to June 30, 1933, there were 571 discharges from the service. Of these, 187 were patients admitted from the Immigration Service for custodial care. These had all been diagnosed as psychotic in other hospitals and were held at Ellis Island pending deportation. They were not studied intensively by us. However, many of them were physically ill, and all required psychiatric care.

The remainder, 384, were admitted for diagnosis and treatment. The classification of these as to source, is as follows:

| | |
|---|-----|
| Seamen on American merchant vessels..... | 174 |
| Officers and enlisted men of the U.S. Coast Guard..... | 34 |
| Beneficiaries of the U.S. Employees' Compensation Commission..... | 29 |
| Personnel of the Public Health Service..... | 2 |
| Personnel of the Lighthouse Service..... | 1 |
| Immigration patients..... | 144 |

The immigration patients are classified as to status as follows:

| | |
|--|----|
| Warrant (i.e., aliens arrested for various reasons after entering the United States of America)..... | 98 |
| Alien passengers..... | 38 |
| Alien seamen..... | 7 |
| Stowaways..... | 1 |

Ten patients at the end of the fiscal year had been on the service more than one year. The diagnoses of these patients were:

| | |
|---|---|
| Encephalitis, hemorrhagic, traumatic..... | 1 |
| General paralysis, cerebral type (dementia paralytica)..... | 3 |
| Hemiplegia..... | 1 |
| Hydrocephalus, internal, traumatic..... | 1 |
| Syphilis, tertiary, of the central nervous system..... | 3 |
| Tabes dorsalis..... | 1 |

The neuropsychiatric and related diagnoses made on the 384 discharges during the fiscal year are given in table 1. Other diagnoses, of course, were made and given careful consideration from the standpoint of the patient's problem, but are omitted for the sake of brevity.

TABLE 1.—*Neuropsychiatric and related diagnoses of 384 discharges from July 1, 1932, to June 30, 1933*

| | | | |
|---|----|--|----|
| Adhesions, dural..... | 1 | Myositis, chronic, left deltoid muscle..... | 1 |
| Alcoholism, chronic (without psychosis)..... | 8 | Myositis, ossificans..... | 1 |
| Amnesia..... | 8 | Neuralgia, toxic..... | 2 |
| Aphasia, motor, cerebral thrombosis..... | 2 | Neuralgia, traumatic..... | 1 |
| Aphasia, sensory, cerebral thrombosis..... | 1 | Neuritis, multiple..... | 1 |
| Arteriosclerosis, cerebral..... | 8 | Neuritis, optic..... | 6 |
| Arteriosclerosis, general..... | 13 | Neuritis, sciatic..... | 2 |
| Atrophy of brain..... | 2 | Neuritis, external popliteal nerve..... | 3 |
| Atrophy, progressive muscular..... | 1 | Neuritis, lumbo-sacral..... | 1 |
| Cicatrix, brain, traumatic..... | 3 | Neuritis, caudo-equinal..... | 1 |
| Constitutional psychopathic inferiority, without psychosis..... | 18 | Neurosis, anxiety..... | 13 |
| Constitutional psychopathic state, criminalism..... | 2 | No diagnosis (insufficient time for observation)..... | 16 |
| Constitutional psychopathic state, emotional instability..... | 6 | No disease..... | 31 |
| Constitutional psychopathic state, inadequate personality..... | 17 | Osteoarthritis, lumbar spine..... | 2 |
| Constitutional psychopathic state, paranoid personality..... | 3 | Otitis interna, chronic..... | 2 |
| Deafness, unilateral, nerve, traumatic..... | 4 | Pachymeningitis, cerebral, hemorrhagic, traumatic..... | 1 |
| Delirium, acute, cerebral malaria..... | 1 | Pachymeningitis, spinal, hemorrhagic, traumatic..... | 1 |
| Dementia praecox, hebephrenic type..... | 10 | Paralysis, agitante..... | 2 |
| Dementia praecox, paranoid type..... | 13 | Paralysis, facial nerve..... | 2 |
| Dementia praecox (mixed)..... | 8 | Paralysis, oculo-motor nerve..... | 1 |
| Drug addiction without psychosis, heroin..... | 13 | Paralysis, right radial nerve..... | 1 |
| Drug addiction without psychosis, luminal..... | 1 | Psychosis, epileptic, deterioration..... | 1 |
| Dysphonia spastica..... | 1 | Psychosis, intoxication, acute hallucinosis (alcoholic)..... | 8 |
| Encephalitis, acute, alcoholic..... | 2 | Psychosis, manic depressive, manic type..... | 1 |
| Encephalitis, traumatic, hemorrhagic..... | 1 | Psychosis, manic depressive, depressive type..... | 2 |
| Encephalitis, lethargic, chronic..... | 3 | Psychosis, senile, delirious and confused states..... | 2 |
| Encephalomyelitis disseminata..... | 1 | Psychosis, senile, depressed and agitated states plus deterioration..... | 1 |
| Epilepsy, grand mal..... | 17 | Psychosis, senile, paranoid states..... | 2 |
| Epilepsy, petit mal..... | 3 | Psychosis, senile, premenstrual type..... | 1 |
| Epilepsy, post encephalitic..... | 1 | Psychosis, traumatic, delirium..... | 1 |
| Epilepsy, Jacksonian..... | 1 | Psychosis, traumatic, post-traumatic enfeeblement..... | 2 |
| General paralysis, cerebral type (dementia paralytica)..... | 15 | Psychosis with constitutional psychopathic inferiority..... | 2 |
| Glioma of cerebellum..... | 1 | Radiculitis..... | 3 |
| Headache, traumatic..... | 1 | Sclerosis, lateral, primary..... | 1 |
| Hematomyelia..... | 1 | Senility..... | 14 |
| Hemiplegia..... | 6 | Syphilis, tertiary (central nervous system not involved)..... | 21 |
| Hemorrhage, sub-arachnoid, traumatic..... | 1 | Syphilis, tertiary, central nervous system (general paralysis and tabes not included)..... | 14 |
| Hydrocephalus, acquired, internal..... | 3 | Tabes dorsalis..... | 7 |
| Hypopituitarism..... | 1 | Thrombosis, posterior inferior cerebellar artery..... | 2 |
| Hysteria..... | 17 | Thrombosis, anterior cerebral artery..... | 1 |
| Meningitis, cerebral, posterior, basal, traumatic, hemorrhagic..... | 1 | Thrombosis, middle cerebral artery..... | 1 |
| Meningitis, spinal, serous, traumatic..... | 1 | Thrombosis, pontine..... | 1 |
| Meningo-encephalitis..... | 1 | Tumor, benign of cerebellum..... | 1 |
| Mental deficiency, moron..... | 9 | Concussion of brain..... | 6 |
| Migraine..... | 1 | Wound, lacerated, scalp..... | 6 |
| Myalgia, left sterno-cleido-mastoid muscle..... | 1 | Alcohol (ethyl) poisoning, acute..... | 10 |
| Myelitis, transverse..... | 2 | | |
| Myelitis, lumbo-sacral..... | 1 | | |

Consultation service in neurology and psychiatry is furnished to our own hospital and to the marine hospital on Staten Island. During the year there were 110 consultations for other services in the Ellis Island Hospital and 189 for Staten Island. Patients seen in consultation who were in need of intensive study or special care by reason of some mental condition, were transferred to the neuropsychiatric service. Many persons suffering from functional disturbances were seen, but the limitations of bed capacity and of personnel trained in psychotherapeutic methods permitted the admission only of those in urgent need of care, or of those whose problems apparently could be rather promptly adjusted.

As a part of the consultation work for the hospital, many "disciplinary" problems are referred to us. Patients who are not adjusting to hospital routine fall, in general, into two rather sharply differentiated classes—first, those who are the victims of some mis-

understanding or unintentional injustice, and, second, psychopathic or frankly psychotic persons from whom a good adjustment cannot be expected. Persons in the first group present no great problem, while those in the second group are, of course, not benefited by the usual disciplinary measures.

All hospital patients suffering from drug addiction or from acute or chronic alcoholism are treated by the neuropsychiatric service. We do not expect, nor do we obtain, any permanent improvement in patients of this character, but a number of them, if hospitalized at intervals, are able to make a good economic adjustment.

A study of the diagnoses in table 1 shows that the material encountered differs from that met with either in a general or a psychopathic hospital. The large number of psychopathic personalities encountered is probably a reflection of a tendency for these persons to drift into the roving, wandering, irregular life of a seaman. We do not mean to imply that a seaman is necessarily unstable or psychopathic. On the contrary, the majority are stable, well-integrated personalities, functioning at a high level of adjustment. What is meant is that certain features of this occupation appeal strongly to psychopathic personalities, and offer them an outlet for their tendencies not found in the more stable and regular occupations.

The incidence of schizophrenia as compared to manic-depressive psychoses is quite high. This may be in part the result of an intensive search by the staff for schizoid mechanisms and a reluctance to diagnose a psychosis as manic-depressive when such mechanisms are present. However, this tendency does not explain entirely the great preponderance of the schizophrenias. It may be that the cyclo-thymic psychoses are so striking that persons suffering from them are hospitalized rather promptly in civilian hospitals and do not reach our service. The fact that there were seen no cases of catatonic praecox, another spectacular reaction type, tends to confirm this impression.

Many cases of conversion hysteria are seen. These patients may or may not have some organic disease, but all present motor or sensory disturbances which are obviously not on an organic basis. In nearly all cases the symptoms can be relieved temporarily or permanently by suggestion.

The number of anxiety neuroses discharged during the year represents only a small proportion of those encountered. The great majority could not be admitted because of lack of facilities. Apparently, neuroses are just as frequent among merchant seamen as in any other group.

An extremely mild type of syphilitic involvement of the central nervous system is encountered, characterized by a paretic colloidal

gold curve, positive Wassermann, a normal or slightly increased cell count, and with minimal detectable neurological or mental changes. Some of these are probably true but incipient cases of dementia paralytica seen much earlier than are those admitted to a psychopathic hospital. They offer an opportunity for the arrest of the process before the central nervous system sustains damage incompatible with economic and social adjustment, and every effort is made to retain these patients in hospital under intensive treatment.

It will be noted that the diagnosis of "malingering" was not made. Persons whose simulation of disease was apparently conscious, and not a true hysteria—that is, an unconscious simulation of organic disease—presented such marked deviations in personality as to make it obvious that the "malingering" was merely an accompanying and secondary symptom of psychopathy or mental deficiency.

An earnest attempt has been made to develop in all personnel an objective attitude toward deviations in behavior, and persons unable to maintain such an attitude are replaced as rapidly as possible. As a result of this policy, there are practically no disciplinary problems in the neuropsychiatric service. When *treatment* and not *punishment* is employed, psychotic and psychopathic patients are much quieter and usually promptly abandon aggressive activity. It is, of course, extremely difficult to maintain this objective attitude toward many psychopathic persons. They seem to have a rather strong drive to create hostility toward themselves, and to take advantage of a situation in order to picture themselves as the victims of injustice. This tendency and the resulting disturbances can be minimized by a steadily maintained and frequently expressed attitude that the patient is not being troublesome because he wants to, but because he cannot help it. By some peculiar slant of the psychopathic mind, this attitude places the patient on his mettle and he tries to prove the physician wrong by improving in emotional control.

In all psychiatric and neurological work, the individual as a whole, and as reacting and attempting to adjust to physical, mental, social, and economic situations, is the point of interest. It is recognized and constantly borne in mind that both from the personal and social viewpoints the important thing is not what physical or mental handicap a person may have, but how adequate his adjustment to it has been. Sometimes a physical handicap may be rectified and a person who is failing to adjust will then be able to carry on. Often, however, the physical burden cannot be lifted, and the attempt must be made to help the patient to function usefully in spite of the handicap. Frequently the overloading is on the mental side, and here the same formula holds. The load must be lightened or the individual strengthened if he is to function in a manner satisfactory to himself and to society.

With the idea in mind of the personality as a dynamic unit, the problems of the individual are approached from three main points of view—the neurological, in terms of damage to the central nervous system as the integrating organ of the personality; the psychological, in the sense of the amount of intelligence available for solving the individual's problems; and the psychiatric, the presence of abnormal thought processes and mental attitudes which interfere with integration and social adjustment.

The most difficult problems encountered are those in which the so-called "post-traumatic syndrome" is involved. By this is meant the person who has met some physical trauma, usually but not always to the head, and complains of headache, dizziness, and many other symptoms not characteristic of known organic disease. The neurological findings are negative and all other physical examinations are usually negative.

An exhaustive study of the patient's past life and present mental status is made, and a large number of these cases are found to be decidedly dull intellectually and give a life history indicating that this dullness has not developed following the injury, but has always been present. Others present a picture of a personality inadequate, unstable, or schizoid previous to the injury. Whether or not there are minute changes in brain tissue not detectable by present diagnostic means, the problem seems to be related closely to that of the "functional" diseases in general, namely, that a personality is capable of carrying a certain load and functioning normally. If this load is increased beyond the breaking point for that particular individual, either in the mental or physical aspects of the personality, integration is interfered with, and adjustment fails partially or completely.

The situation with relation to treatment is, of course, greatly complicated by economic factors. Most of these patients seen by us either have the possibility of collecting damages against some company or are compensable by the United States Employees' Compensation Commission, if their condition is believed to have been caused or aggravated by the injury.

The treatment of luetic cases is planned and supervised jointly by the neuropsychiatric and the urological services, and administered by the latter service. Fever treatment for syphilis of the central nervous system is given by means of an apparatus for administering radiant heat from incandescent bulbs. The body temperature is recorded by means of a thermocouple in the patient's rectum. Body temperatures of 106°–107° F. can be maintained for hours without serious discomfort or damage to the patient. Sufficient data have not yet been collected to indicate the value of this method as compared with malaria or other methods of elevating the temperature.

The therapeutic approach to mental conditions is along dynamic lines. The attempt is made first to understand the patient's difficulties and then to help him to understand and cope with them. As an adjunct in treatment, hypnosis is being tried in certain cases. No such startling and spectacular results as are reported by some workers have been found, and a considerable number of patients cannot be hypnotized. However, it is useful at times in uncovering buried memories, particularly as related to the conversion hysterias, and sometimes in dream interpretation. Some improvement is noted as a result of direct suggestion given while under hypnosis. It is an excellent method for strengthening *rapport* with a patient, and after hypnosis a patient will frequently talk quite freely about his difficulties. Its greatest use seems to be in promptly uncovering the buried memories of a functional amnesia.

It would seem that the creation of the neuropsychiatric service has proved to be a wise procedure; its operation, it is believed, has greatly increased the usefulness of the hospital by devoting special care and attention to a group of cases which give more than the usual concern, and it has served to stimulate in the professional personnel of the hospital, in general, a broader attitude toward their patients with a quicker recognition of problems which are unfortunately sometimes overlooked. It has proved of material assistance in the general discipline of the hospital. It has also rendered useful and worthy service in the handling of many difficult compensation cases. Altogether the first year's experiences with this clinic has in our judgment more than justified the expense involved in its creation.

COURT DECISIONS RELATING TO PUBLIC HEALTH

Occupational disease act upheld and construed.—(Illinois Supreme Court; *First Nat. Bank of Ottawa v. Wedron Silica Co.*, 184 N.E. 897, and *Madison v. Wedron Silica Co.*, 184 N.E. 901; decided Feb. 23, 1933.) Proceeding under the Occupational Disease Act, actions to recover damages because of the contraction of silicosis were brought by persons who had been employed by the defendant silica company. Section 1 of the said act provided, in substance, that every employer engaged in any work or process which may produce illness or disease peculiar to such work, or which subjects employees to illness or disease incident to such work to which employees are not ordinarily exposed in other lines of employment, should, for the employees' protection, adopt and provide reasonable and approved devices, means, or methods for preventing such industrial or occupational diseases. Section 2 declared certain specified employments to be especially dangerous to the health of employees engaged therein, and such section

and other portions of the act imposed certain detailed requirements upon employers, all with a view to the prevention of occupational diseases in such employments. For any injury to the health of any employee proximately caused by the willful violation of or the willful failure to comply with section 1, there was provided to the injured party a right of action for damages not exceeding \$10,000. To all cases of occupational diseases arising out of the industries named in section 2, the provisions of the Workmen's Compensation Act were made applicable, such occupational diseases being given the status of accidental injuries arising out of and in the course of employment.

From judgments adverse to it in the trial court, the defendant company appealed to the supreme court. It was argued by the defendant that to permit employers enumerated in section 2 of the act to receive the benefit of a limited liability under the Workmen's Compensation Act and at the same time to impose a different liability upon those employers engaged in processes of manufacture other than those described in section 2 created a class out of a previously established class and subjected those classified under section 1 to greater burdens than those enumerated under section 2. But the supreme court took the view that it was unable to say that the legislature did violence to the State or Federal constitution when it provided different remedies for the different classes of industries. It also held that the act did not bestow any special privilege by special legislation contrary to section 22 of article 4 of the State constitution, saying that "The provisions of the act respecting each class impinge uniformly upon all within the class."

Respecting a point raised by the defendant as to the period within which an action for damages under the act should be commenced, the appellate court said:

* * * The statute of limitations does not commence to run until the right of action arises. That arises upon disablement—i. e., when the occupational disease puts him [the employee] in such a condition that he must quit work.

DEATHS DURING WEEK ENDED AUGUST 26, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

| | Week ended Aug. 26, 1933 | Correspond- ing week 1932 |
|---|--------------------------------|---------------------------------|
| Data from 85 large cities of the United States: | | |
| Total deaths..... | 6,403 | 6,601 |
| Deaths per 1,000 population, annual basis..... | 9.0 | 9.4 |
| Deaths under 1 year of age..... | 451 | 578 |
| Deaths under 1 year of age per 1,000 estimated live births (81 cities)..... | 30 | 48 |
| Deaths per 1,000 population, annual basis, first 34 weeks of year..... | 11.1 | 11.4 |
| Data from industrial insurance companies: | | |
| Policies in force..... | 67,759,927 | 71,074,300 |
| Number of death claims..... | 11,363 | 11,304 |
| Death claims per 1,000 policies in force, annual rate..... | 8.7 | 8.2 |
| Death claims per 1,000 policies, first 34 weeks of year, annual rate..... | 10.1 | 9.8 |

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended September 2, 1933, and September 3, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 2, 1933, and Sept. 3, 1932

| Division and State | Diphtheria | | Influenza | | Measles | | Meningococcus meningitis | |
|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 |
| New England States: | | | | | | | | |
| Maine | | 3 | | 9 | 3 | 5 | 0 | 0 |
| New Hampshire | | | | | 2 | | 0 | 0 |
| Vermont | 1 | 3 | | | | 1 | 0 | 0 |
| Massachusetts | 12 | 10 | | 2 | 31 | 32 | 3 | 0 |
| Rhode Island | 1 | | | | | 3 | 0 | 0 |
| Connecticut | 1 | 11 | 2 | | 7 | 7 | 0 | 0 |
| Middle Atlantic States: | | | | | | | | |
| New York | 20 | 38 | 11 | 14 | 39 | 80 | 2 | 3 |
| New Jersey | 3 | 9 | 3 | 2 | 15 | 39 | 1 | 1 |
| Pennsylvania | 30 | 41 | | | 38 | 51 | 7 | 5 |
| East North Central States: | | | | | | | | |
| Ohio | 24 | 15 | 28 | 6 | 16 | 24 | 1 | 4 |
| Indiana | 14 | 23 | 26 | 10 | 3 | 7 | 1 | 0 |
| Illinois | 11 | 34 | | 25 | 13 | 20 | 2 | 1 |
| Michigan | 14 | 8 | | | 8 | 39 | 1 | 3 |
| Wisconsin | 1 | 12 | 10 | 39 | 11 | 29 | 0 | 2 |
| West North Central States: | | | | | | | | |
| Minnesota | 8 | 4 | 1 | 2 | 4 | 4 | 0 | 1 |
| Iowa | 10 | 3 | | | | | 0 | 0 |
| Missouri | 18 | 20 | | | 15 | 2 | 0 | 0 |
| North Dakota | 13 | 1 | 3 | | 8 | 2 | 0 | 0 |
| South Dakota | 2 | | | | | | 0 | 0 |
| Nebraska | 5 | 4 | | | | 3 | 0 | 0 |
| Kansas | 9 | 14 | | | 5 | 3 | 1 | 2 |
| South Atlantic States: | | | | | | | | |
| Delaware | 1 | 1 | 1 | | 2 | | 1 | 0 |
| Maryland | 3 | 7 | 7 | 1 | 4 | 4 | 1 | 1 |
| District of Columbia | 3 | 2 | | | 1 | | 0 | 1 |
| Virginia | 28 | 20 | | | 9 | 5 | 3 | 0 |
| West Virginia | 33 | 35 | 12 | | 10 | 18 | 2 | 0 |
| North Carolina | 62 | 41 | 7 | 12 | 13 | 20 | 0 | 1 |
| South Carolina | 8 | 14 | 92 | 102 | 44 | 2 | 0 | 0 |
| Georgia | 26 | 23 | | 19 | 24 | 1 | 0 | 0 |
| Florida | 16 | 25 | | 3 | 10 | 3 | 0 | 0 |

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers
for weeks ended Sept. 2, 1933, and Sept. 3, 1932—Continued

| Division and State | Diphtheria | | Influenza | | Measles | | Meningococcus meningitis | |
|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 |
| East South Central States: | | | | | | | | |
| Kentucky..... | 42 | 42 | | 4 | | 4 | 1 | 1 |
| Tennessee..... | 21 | 37 | 16 | 6 | 3 | 1 | 0 | 1 |
| Alabama..... | 50 | 50 | 4 | 6 | 31 | 1 | 0 | 2 |
| Mississippi..... | 28 | 23 | | | | | 0 | 0 |
| West South Central States: | | | | | | | | |
| Arkansas..... | 17 | 23 | 1 | 6 | 40 | 6 | 0 | 0 |
| Louisiana..... | 17 | 20 | 8 | 6 | | 3 | 1 | 3 |
| Oklahoma..... | 20 | 39 | 5 | 5 | | | 0 | 1 |
| Texas..... | 87 | 67 | 56 | 16 | 11 | 4 | 0 | 0 |
| Mountain States: | | | | | | | | |
| Montana..... | 3 | | 3 | | 4 | 27 | 0 | 0 |
| Idaho..... | | | | | 1 | | 0 | 0 |
| Wyoming..... | | 1 | 1 | 1 | 1 | 3 | 0 | 0 |
| Colorado..... | 3 | 6 | | | | 5 | 0 | 0 |
| New Mexico..... | 10 | 8 | | | 2 | | 0 | 1 |
| Arizona..... | | 3 | 4 | 1 | | 3 | 0 | 0 |
| Utah..... | | 2 | | | 4 | 2 | 0 | 0 |
| Pacific States: | | | | | | | | |
| Washington..... | 3 | 3 | | | 5 | 7 | 0 | 0 |
| Oregon..... | 1 | 2 | 5 | 11 | 13 | 8 | 0 | 0 |
| California..... | 30 | 13 | 10 | 52 | 43 | 23 | 1 | 1 |
| Total | 737 | 799 | 314 | 380 | 409 | 506 | 20 | 35 |
| Division and State | Polliomylitis | | Scarlet fever | | Smallpox | | Typhoid fever | |
| | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 | Week ended Sept. 2, 1933 | Week ended Sept. 3, 1932 |
| New England States: | | | | | | | | |
| Maine..... | 3 | 0 | 2 | 9 | 0 | 0 | 3 | 3 |
| New Hampshire..... | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 |
| Vermont..... | 3 | 0 | 4 | 6 | 0 | 0 | 0 | 0 |
| Massachusetts..... | 32 | 2 | 64 | 55 | 0 | 0 | 4 | 9 |
| Rhode Island..... | 1 | 0 | 6 | 3 | 0 | 0 | 1 | 0 |
| Connecticut..... | 11 | 3 | 9 | 9 | 0 | 0 | 5 | 2 |
| Middle Atlantic States: | | | | | | | | |
| New York..... | 104 | 20 | 72 | 77 | 0 | 8 | 52 | 45 |
| New Jersey..... | 14 | 33 | 21 | 26 | 0 | 0 | 6 | 11 |
| Pennsylvania..... | 50 | 113 | 111 | 134 | 0 | 0 | 48 | 92 |
| East North Central States: | | | | | | | | |
| Ohio..... | 22 | 6 | 90 | 144 | 1 | 0 | 51 | 100 |
| Indiana..... | 4 | 0 | 22 | 20 | 0 | 1 | 14 | 20 |
| Illinois..... | 14 | 11 | 88 | 68 | 1 | 2 | 40 | 25 |
| Michigan..... | 3 | 7 | 35 | 46 | 0 | 1 | 22 | 23 |
| Wisconsin..... | 1 | 1 | 22 | 15 | 5 | 0 | 0 | 8 |
| West North Central States: | | | | | | | | |
| Minnesota..... | 31 | 11 | 20 | 17 | 0 | 0 | 3 | 3 |
| Iowa..... | 3 | 3 | 0 | 5 | 0 | 2 | 5 | 8 |
| Missouri..... | 1 | 0 | 17 | 28 | 0 | 0 | 12 | 30 |
| North Dakota..... | 10 | 0 | 4 | 4 | 0 | 0 | 3 | 5 |
| South Dakota..... | 1 | 1 | 1 | 3 | 0 | 0 | 4 | 3 |
| Nebraska..... | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 1 |
| Kansas..... | 5 | 5 | 28 | 19 | 1 | 1 | 14 | 24 |
| South Atlantic States: | | | | | | | | |
| Delaware..... | 0 | 3 | 3 | 4 | 0 | 0 | 1 | 1 |
| Maryland..... | 2 | 1 | 17 | 30 | 0 | 0 | 27 | 27 |
| District of Columbia..... | 0 | 5 | 2 | 6 | 0 | 0 | 1 | 6 |
| Virginia..... | 3 | 1 | 25 | 33 | 0 | 0 | 42 | 38 |
| West Virginia..... | 3 | 4 | 42 | 23 | 0 | 0 | 57 | 57 |
| North Carolina..... | 1 | 1 | 70 | 45 | 0 | 1 | 30 | 36 |
| South Carolina..... | 1 | 2 | 3 | 7 | 0 | 0 | 30 | 41 |
| Georgia..... | 1 | 0 | 4 | 12 | 1 | 0 | 53 | 72 |
| Florida..... | 0 | 0 | 1 | 3 | 0 | 0 | 2 | 6 |

See footnote at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Sept. 2, 1933, and Sept. 3, 1932—Continued

| Division and State | Poliomyelitis | | Scarlet fever | | Smallpox | | Typhoid fever | |
|-----------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | Week ended 2, 1933 | Week ended 3, 1932 | Week ended 2, 1933 | Week ended 3, 1932 | Week ended 2, 1933 | Week ended 3, 1932 | Week ended 2, 1933 | Week ended 3, 1932 |
| East South Central States: | | | | | | | | |
| Kentucky..... | 1 | 0 | 62 | 34 | 0 | 0 | 52 | 06 |
| Tennessee..... | 7 | 4 | 42 | 40 | 0 | 0 | 46 | 74 |
| Alabama ¹ | 1 | 8 | 18 | 32 | 0 | 1 | 26 | 32 |
| Mississippi ² | 0 | 0 | 7 | 10 | 0 | 0 | 10 | 23 |
| West South Central States: | | | | | | | | |
| Arkansas..... | 0 | 2 | 7 | 7 | 2 | 0 | 16 | 23 |
| Louisiana..... | 1 | 2 | 12 | 9 | 0 | 0 | 21 | 39 |
| Oklahoma ³ | 0 | 2 | 4 | 11 | 0 | 0 | 17 | 49 |
| Texas ⁴ | 1 | 0 | 43 | 19 | 2 | 0 | 41 | 62 |
| Mountain States: | | | | | | | | |
| Montana..... | 0 | 0 | 6 | 7 | 0 | 3 | 1 | 6 |
| Idaho..... | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 0 |
| Wyoming ⁵ | 0 | 0 | 6 | 7 | 0 | 1 | 1 | 1 |
| Colorado..... | 0 | 0 | 12 | 10 | 1 | 0 | 15 | 13 |
| New Mexico..... | 1 | 1 | 2 | 13 | 0 | 0 | 15 | 4 |
| Arizona..... | 0 | 0 | 2 | 3 | 3 | 0 | 5 | 1 |
| Utah ⁶ | 0 | 0 | 0 | 5 | 0 | 0 | 2 | 1 |
| Pacific States: | | | | | | | | |
| Washington..... | 3 | 0 | 12 | 25 | 1 | 6 | 4 | 8 |
| Oregon..... | 0 | 0 | 11 | 3 | 2 | 1 | 5 | 8 |
| California..... | 2 | 9 | 54 | 40 | 3 | 4 | 8 | 6 |
| Total..... | 401 | 262 | 1,069 | 1,125 | 23 | 22 | 806 | 1,209 |

¹ New York City only.

² Rocky Mountain spotted fever, week ended Sept. 2, 1933, 9 cases, as follows: New York, 2; Maryland, 1; North Carolina, 3; Georgia, 2; Wyoming, 1.

³ Typhus fever, week ended Sept. 2, 1933, 67 cases, as follows: Illinois, 1; South Carolina, 6; Georgia, 26; Alabama, 21; Texas, 13.

⁴ Week ended earlier than Saturday.

⁵ Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

| State | Menin- gococ- cus menin- gitis | Diph- theria | Influ- enza | Malaria | Measles | Pei- lagra | Polio- mye- litis | Scarlet fever | Small- pox | Ty- phoid fever |
|------------------|---|-----------------|----------------|---------|---------|---------------|-------------------------|------------------|---------------|-----------------------|
| July 1933 | | | | | | | | | | |
| Kansas..... | 1 | 22 | 1 | 2 | 53 | | 9 | 60 | 0 | 48 |
| Mississippi..... | 1 | 36 | 384 | 7,602 | 247 | 891 | | 29 | 4 | 97 |
| Nevada..... | | 1 | | | 5 | | 0 | 3 | 4 | 3 |
| Virginia..... | 6 | 45 | 111 | 26 | 270 | 42 | 3 | 101 | 1 | 236 |

| July 1933 | Cases | Ophthalmia neonatorum: | Cases | Trench mouth: | Cases |
|--------------------------|-------|-------------------------------|-------|-------------------|-------|
| Chicken pox: | | Kansas..... | 1 | Kansas..... | 1 |
| Kansas..... | 10 | Virginia..... | 1 | Tularaemia: | |
| Mississippi..... | 103 | Paratyphoid fever: | | Nevada..... | 4 |
| Nevada..... | 2 | Virginia..... | 20 | Virginia..... | 4 |
| Virginia..... | 30 | Puerperal septicaemia: | | Typhus fever: | |
| Dengue: | | Mississippi..... | 21 | Virginia..... | 3 |
| Mississippi..... | 8 | Rabies in animals: | | Undulant fever: | |
| Diarrhoea and dysentery: | | Mississippi..... | 4 | Kansas..... | 2 |
| Virginia..... | 1,385 | Rocky Mountain spotted fever: | | Mississippi..... | 1 |
| Dysentery: | | Nevada..... | 3 | Virginia..... | 7 |
| Mississippi (amebic).... | 73 | Virginia..... | 11 | Vincent's angina: | |
| German measles: | | Kansas..... | 1 | Kansas..... | 1 |
| Kansas..... | 13 | Septic sore throat: | | Whooping cough: | |
| Hookworm disease: | | Kansas..... | 3 | Kansas..... | 290 |
| Mississippi..... | 652 | Nevada..... | 1 | Mississippi..... | 1,043 |
| Impetigo contagiosa: | | Virginia..... | 19 | Nevada..... | 6 |
| Kansas..... | 1 | Tetanus: | | Virginia..... | 319 |
| Lethargic encephalitis: | | Kansas..... | 4 | | |
| Kansas..... | 6 | Virginia..... | 4 | | |
| Mumps: | | Trachoma: | | | |
| Kansas..... | 68 | Mississippi..... | 1 | | |
| Mississippi..... | 87 | Virginia..... | 3 | | |
| Virginia..... | 54 | | | | |

From July 31 to September 6, 1933, 343 cases of lethargic encephalitis with 49 deaths were reported in the county of St. Louis, Mo., and 235 cases and 28 deaths in the city of St. Louis. The totals for the city and county were 578 cases and 77 deaths.

City reports for week ended Aug. 26, 1933

| State and city | Diph-theria cases | Influenza | | Meas-les cases | Pneu-monia deaths | Scar-let fever cases | Small-pox cases | Tuber-culosis deaths | Ty-phoid fever cases | Whoop-ing cough cases | Deaths, all causes |
|-----------------------------|-------------------|-----------|--------|----------------|-------------------|----------------------|-----------------|----------------------|----------------------|-----------------------|--------------------|
| | | Cases | Deaths | | | | | | | | |
| Maine: | | | | | | | | | | | |
| Portland..... | 0 | | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 23 |
| New Hampshire: | | | | | | | | | | | |
| Concord..... | 0 | | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 9 |
| Nashua..... | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Vermont: | | | | | | | | | | | |
| Burlington.... | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Massachusetts: | | | | | | | | | | | |
| Boston..... | 4 | | 0 | 13 | 8 | 21 | 0 | 13 | 3 | 36 | 175 |
| Fall River..... | 1 | | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 24 |
| Worcester..... | 0 | | 0 | 8 | 5 | 2 | 0 | 1 | 0 | 4 | 30 |
| Rhode Island: | | | | | | | | | | | |
| Pawtucket..... | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| Providence..... | 0 | | 0 | 6 | 2 | 6 | 0 | 1 | 0 | 17 | 64 |
| Connecticut: | | | | | | | | | | | |
| Bridgeport.... | 1 | 1 | 1 | 0 | 1 | 4 | 0 | 0 | 1 | 0 | 25 |
| Hartford..... | 0 | | 0 | 9 | 0 | 2 | 0 | 1 | 0 | 1 | 32 |
| New Haven..... | 2 | | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 10 | 33 |
| New York: | | | | | | | | | | | |
| Buffalo..... | 0 | | 0 | 5 | 7 | 5 | 0 | 5 | 3 | 27 | 97 |
| New York..... | 14 | 3 | 3 | 10 | 60 | 16 | 0 | 69 | 21 | 133 | 1,000 |
| Rochester..... | 0 | | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 2 | 57 |
| Syracuse..... | 0 | | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 15 | 41 |
| New Jersey: | | | | | | | | | | | |
| Camden..... | 0 | | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 21 |
| Newark..... | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 10 | 0 | 34 | 88 |
| Trenton..... | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 23 |
| Pennsylvania: | | | | | | | | | | | |
| Philadelphia.. | 2 | 2 | 2 | 15 | 12 | 12 | 0 | 20 | 1 | 9 | 352 |
| Pittsburgh..... | 1 | | 0 | 2 | 8 | 8 | 0 | 2 | 2 | 60 | 103 |
| Reading..... | 1 | | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 6 | 16 |
| Ohio: | | | | | | | | | | | |
| Cincinnati.... | 1 | | 1 | 2 | 5 | 8 | 0 | 7 | 0 | 26 | 100 |
| Cleveland..... | 1 | 16 | 1 | 1 | 5 | 7 | 0 | 7 | 4 | 25 | 181 |
| Columbus..... | 0 | | 0 | 0 | 1 | 10 | 0 | 1 | 3 | 0 | 68 |
| Toledo..... | 1 | | 0 | 0 | 2 | 12 | 0 | 4 | 1 | 8 | 68 |
| Indiana: | | | | | | | | | | | |
| Fort Wayne.... | 1 | | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 27 |
| Indianapolis.. | 0 | | 0 | 1 | 2 | 4 | 0 | 3 | 4 | 6 | |
| South Bend.... | 1 | | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 1 | 16 |
| Terre Haute... Illinois: | 2 1 | | 0 0 | 0 0 | 0 1 | 0 0 | 0 0 | 0 1 | 1 0 | 0 6 | 8 16 |
| Chicago..... | 1 | | 0 | 6 | 25 | 43 | 0 | 34 | 2 | 61 | 863 |
| Springfield... Michigan: | 0 13 | | 0 1 | 0 4 | 0 3 | 0 6 | 0 0 | 0 14 | 1 0 | 1 53 | 21 212 |
| Detroit..... | 0 | | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 4 | 26 |
| Flint..... | 0 | | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 2 | 20 |
| Grand Rapids. Wisconsin: | 0 0 | | 0 0 | 0 0 | 0 0 | 0 0 | 0 0 | 1 0 | 0 0 | 0 0 | 7 9 |
| Kenosha..... | 0 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | |
| Madison..... | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Milwaukee.... | 1 | | 0 | 0 | 3 | 4 | 0 | 4 | 0 | 12 | 77 |
| Superior..... | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Minnesota: | | | | | | | | | | | |
| Duluth..... | 0 | | 0 | 8 | 0 | 1 | 0 | 0 | 0 | 7 | 11 |
| Minneapolis.. | 6 | | 0 | 2 | 1 | 2 | 0 | 2 | 0 | 1 | 76 |
| St. Paul..... | 0 | | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 22 | 56 |
| Iowa: | | | | | | | | | | | |
| Des Moines.... | 6 | | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 28 |
| Sioux City.... | 0 | | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| Waterloo..... | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | |

City reports for week ended Aug. 26, 1933—Continued

| State and city | Diph- theria cases | Influenza | | Mea- sles cases | Pneu- monia deaths | Scar- let fever cases | Small- pox cases | Tuber- culosis deaths | Ty- phoid fever cases | Whoop- ing cough cases | Deaths, all causes |
|----------------------------|--------------------------|-----------|--------|-----------------------|--------------------------|--------------------------------|------------------------|-----------------------------|--------------------------------|---------------------------------|--------------------------|
| | | Cases | Deaths | | | | | | | | |
| Missouri: | | | | | | | | | | | |
| Kansas City | 0 | | 0 | 0 | 0 | 2 | 0 | 3 | 1 | 4 | 50 |
| St. Joseph | 0 | | 0 | 1 | 3 | 2 | 0 | 1 | 0 | 1 | 22 |
| St. Louis | 4 | 1 | | 0 | 2 | 3 | 0 | 11 | 10 | 8 | 170 |
| North Dakota: | | | | | | | | | | | |
| Fargo | 0 | | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 14 |
| Grand Forks | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Dakota: | | | | | | | | | | | |
| Sioux Falls | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 7 |
| Nebraska: | | | | | | | | | | | |
| Omaha | 0 | | 0 | 0 | 1 | 8 | 0 | 1 | 0 | 7 | 43 |
| Kansas: | | | | | | | | | | | |
| Topeka | 1 | | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 4 | 14 |
| Wichita | 1 | | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 3 | 0 |
| Delaware: | | | | | | | | | | | |
| Wilmington | 0 | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 11 |
| Maryland: | | | | | | | | | | | |
| Baltimore | 1 | 3 | 1 | 0 | 2 | 6 | 0 | 7 | 2 | 41 | 145 |
| Cumberland | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Frederick | 0 | | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 8 |
| District of Colum- bia: | | | | | | | | | | | |
| Washington | 4 | 1 | 1 | 3 | 3 | 4 | 0 | 8 | 3 | 12 | 116 |
| Virginia: | | | | | | | | | | | |
| Lynchburg | 0 | | 0 | 6 | 0 | 0 | 0 | 2 | 0 | 6 | 18 |
| Richmond | 1 | | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 33 |
| Roanoke | 0 | | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 18 |
| West Virginia: | | | | | | | | | | | |
| Charleston | 0 | | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 2 | 31 |
| Huntington | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wheeling | 0 | | 0 | 2 | 0 | 2 | 0 | 0 | 3 | 1 | 10 |
| North Carolina: | | | | | | | | | | | |
| Raleigh | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 9 |
| Wilmington | 0 | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 10 |
| Winston-Salem | 7 | 1 | 1 | 5 | 2 | 4 | 0 | 2 | 0 | 1 | 17 |
| South Carolina: | | | | | | | | | | | |
| Charleston | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 27 |
| Columbia | 0 | | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 20 |
| Greenville | 0 | | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 8 |
| Georgia: | | | | | | | | | | | |
| Atlanta | 11 | 3 | 1 | 0 | 4 | 2 | 0 | 3 | 16 | 4 | 64 |
| Brunswick | 0 | | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 5 |
| Savannah | 1 | 2 | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 25 |
| Florida: | | | | | | | | | | | |
| Miami | 2 | | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 5 | 20 |
| Tampa | 4 | | 0 | 0 | 0 | 1 | 0 | 5 | 2 | 0 | 25 |
| Kentucky: | | | | | | | | | | | |
| Ashland | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| Lexington | 0 | | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 17 |
| Louisville | 0 | 1 | 0 | 0 | 5 | 1 | 0 | 1 | 3 | 0 | 67 |
| Tennessee: | | | | | | | | | | | |
| Memphis | 1 | | 0 | 0 | 4 | 2 | 0 | 6 | 4 | 0 | 78 |
| Nashville | 3 | | 0 | 0 | 0 | 4 | 0 | 2 | 1 | 2 | 45 |
| Alabama: | | | | | | | | | | | |
| Birmingham | 6 | | 1 | 0 | 2 | 2 | 0 | 3 | 2 | 0 | 61 |
| Mobile | 1 | | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 19 |
| Montgomery | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | |
| Arkansas: | | | | | | | | | | | |
| Fort Smith | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Little Rock | 0 | | 0 | 0 | 3 | 2 | 0 | 1 | 1 | 0 | 8 |
| Louisiana: | | | | | | | | | | | |
| New Orleans | 15 | 4 | 4 | 0 | 4 | 4 | 0 | 9 | 7 | 1 | 126 |
| Shreveport | 0 | | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 0 | 25 |
| Oklahoma: | | | | | | | | | | | |
| Oklahoma City | 1 | | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 38 |
| Tulsa | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| Texas: | | | | | | | | | | | |
| Dallas | 6 | | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 5 | 62 |
| Fort Worth | 0 | | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 32 |
| Galveston | 2 | | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 13 |
| Houston | 7 | | 0 | 0 | 5 | 1 | 0 | 2 | 1 | 0 | 56 |
| San Antonio | 3 | | 0 | 0 | 0 | 2 | 0 | 5 | 0 | 0 | 45 |

¹ 2 nonresidents.

City reports for week ended Aug. 26, 1933—Continued

| State and city | Diphtheria cases | Influenza | | Measles cases | Pneumonia deaths | Scarlet fever cases | Smallpox cases | Tuberculosis deaths | Typhoid fever cases | Whooping cough cases | Deaths, all causes |
|----------------|------------------|-----------|--------|---------------|------------------|---------------------|----------------|---------------------|---------------------|----------------------|--------------------|
| | | Cases | Deaths | | | | | | | | |
| Montana: | | | | | | | | | | | |
| Billings | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Great Falls | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 7 |
| Helena | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Missoula | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Idaho: | | | | | | | | | | | |
| Boise | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| Colorado: | | | | | | | | | | | |
| Denver | 0 | 11 | 1 | 0 | 5 | 0 | 0 | 5 | 1 | 17 | 69 |
| Pueblo | 0 | | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 10 |
| New Mexico: | | | | | | | | | | | |
| Albuquerque | 0 | | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 16 |
| Utah: | | | | | | | | | | | |
| Salt Lake City | 0 | | 0 | 5 | 0 | 2 | 0 | 2 | 0 | 10 | 23 |
| Nevada: | | | | | | | | | | | |
| Reno | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Washington: | | | | | | | | | | | |
| Seattle | 0 | | | 2 | | 7 | 0 | | 0 | 17 | |
| Spokane | 0 | | | 5 | | 0 | 0 | | 0 | 0 | 17 |
| Tacoma | 0 | | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 6 | 31 |
| Oregon: | | | | | | | | | | | |
| Portland | 1 | | 0 | 1 | 6 | 1 | 1 | 5 | 1 | 2 | 69 |
| Salem | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| California: | | | | | | | | | | | |
| Los Angeles | 14 | 10 | 1 | 1 | 6 | 9 | 1 | 18 | 1 | 59 | 277 |
| Sacramento | | | 0 | 0 | 1 | 1 | 0 | 4 | 0 | 1 | 23 |
| San Francisco | 1 | 1 | 2 | 1 | 5 | 7 | 0 | 6 | 0 | 11 | 141 |

| State and city | Meningococcus meningitis | | Polymy- elitis cases | State and city | Meningococcus meningitis | | Polymy- elitis cases |
|----------------|--------------------------|--------|-------------------------|----------------|--------------------------|--------|-------------------------|
| | Cases | Deaths | | | Cases | Deaths | |
| Massachusetts: | | | | Minnesota: | | | |
| Boston | 0 | 0 | 29 | Duluth | 0 | 0 | 1 |
| Fall River | 0 | 0 | 1 | Minneapolis | 0 | 0 | 2 |
| Worcester | 0 | 0 | 3 | St. Paul | 0 | 0 | 1 |
| Rhode Island: | | | | Missouri: | | | |
| Providence | 0 | 0 | 1 | St. Joseph | 1 | 0 | 0 |
| New York: | | | | St. Louis | 0 | 0 | 2 |
| Buffalo | 0 | 0 | 2 | North Dakota: | | | |
| New York | 8 | 5 | 80 | Fargo | 0 | 0 | 3 |
| Rochester | 0 | 0 | 1 | Kentucky: | | | |
| New Jersey: | | | | Louisville | 0 | 0 | 1 |
| Newark | 0 | 0 | 5 | Tennessee: | | | |
| Pennsylvania: | | | | Memphis | 0 | 0 | 2 |
| Pittsburgh | 1 | 0 | 11 | Louisiana: | | | |
| Reading | 0 | 1 | 0 | New Orleans | 2 | 1 | 1 |
| Ohio: | | | | Utah: | | | |
| Cincinnati | 0 | 0 | 2 | Salt Lake City | 0 | 0 | 1 |
| Cleveland | 0 | 0 | 6 | Washington: | | | |
| Illinois: | | | | Seattle | 2 | 0 | 2 |
| Chicago | 3 | 0 | 14 | California: | | | |
| Michigan: | | | | Los Angeles | 3 | 1 | 2 |
| Detroit | 0 | 0 | 3 | | | | |

Lethargic encephalitis.—Cases: Bridgeport, Conn., 1; Camden, N.J., 1; Cleveland, 3; Chicago, 1; Detroit, 1; Duluth, 1; Kansas City, Mo., 2; St. Louis, 75; Fargo, N.Dak., 2; Omaha, 2; Charleston, S.C., 1; Dallas, Tex., 1.

Typhus fever.—Cases: Charleston, S.C., 2; Savannah, 3; Tampa, 2; Mobile, 1.

Pellagra.—Cases: Charleston, S.C., 1; Birmingham, 2; New Orleans, 1; Los Angeles, 2.

Rabies in man.—Deaths: Memphis, 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—2 weeks ended August 26, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended August 26, 1933, as follows:

| Disease | Cases | Disease | Cases |
|-----------------------------|-------|---------------------|-------|
| Chicken pox..... | 28 | Poliomyelitis..... | 4 |
| Diphtheria..... | 32 | Scarlet fever..... | 40 |
| Erysipelas..... | 6 | Tuberculosis..... | 114 |
| Influenza..... | 1 | Typhoid fever..... | 84 |
| Lethargic encephalitis..... | 1 | Whooping cough..... | 168 |
| Measles..... | 26 | | |

CZECHOSLOVAKIA

Communicable diseases—June 1933.—During the month of June 1933, certain communicable diseases were reported in Czechoslovakia as follows:

| Disease | Cases | Deaths | Disease | Cases | Deaths |
|-------------------------------|-------|--------|------------------------|-------|--------|
| Anthrax..... | 4 | — | Paratyphoid fever..... | 11 | — |
| Cerebrospinal meningitis..... | 11 | 4 | Poliomyelitis..... | 15 | 2 |
| Chicken pox..... | 452 | — | Puerperal fever..... | 35 | 23 |
| Diphtheria..... | 1,861 | 75 | Scarlet fever..... | 2,149 | 23 |
| Dysentery..... | 6 | 1 | Trachoma..... | 123 | — |
| Influenza..... | 42 | 6 | Typhoid fever..... | 319 | 21 |
| Lethargic encephalitis..... | 2 | — | Typhus fever..... | 9 | — |

JAMAICA

Communicable diseases—Four weeks ended July 15, 1933.—During the 4 weeks ended July 15, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica, outside of Kingston, as follows:

| Disease | Kingston | Other localities | Disease | Kingston | Other localities |
|-------------------------------|----------|------------------|----------------------|----------|------------------|
| Cerebrospinal meningitis..... | — | 1 | Puerperal fever..... | — | 3 |
| Chicken pox..... | — | 3 | Scarlet fever..... | 1 | 1 |
| Diphtheria..... | 3 | 1 | Tuberculosis..... | 35 | 70 |
| Dysentery..... | 9 | 10 | Typhoid fever..... | 19 | 83 |
| Erysipelas..... | — | 1 | | | |

MEXICO

Tampico—Communicable diseases—July 1933.—During the month of July 1933, certain communicable diseases were reported in Tampico, Mexico, as follows:

| Disease | Cases | Deaths | Disease | Cases | Deaths |
|-------------------------|-------|--------|------------------------|-------|--------|
| Chicken pox..... | 1 | — | Paratyphoid fever..... | — | 3 |
| Enteritis, various..... | — | 43 | Scabies..... | 1 | — |
| Erysipelas..... | 3 | — | Tuberculosis..... | 25 | 23 |
| Influenza..... | 25 | — | Typhoid fever..... | 8 | 4 |
| Malaria..... | 249 | 8 | Whooping cough..... | 33 | 1 |
| Measles..... | 54 | 11 | | | |

PANAMA CANAL ZONE

Communicable diseases—April–June 1933.—During the months of April, May, and June 1933, certain communicable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

| Disease | April | | May | | June | |
|---------------------------|-------|--------|-------|--------|-------|--------|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths |
| Chicken pox..... | 34 | — | 24 | — | 18 | — |
| Diphtheria..... | 13 | 2 | 8 | 1 | 7 | — |
| Dysentery, amebic..... | — | 1 | 11 | 1 | 15 | 3 |
| Dysentery, bacillary..... | 2 | — | 1 | — | — | — |
| Leprosy..... | 1 | — | 1 | — | — | 1 |
| Malaria..... | 74 | 4 | 240 | 3 | 438 | 9 |
| Measles..... | 29 | 1 | 30 | — | 37 | 1 |
| Mumps..... | 3 | — | 2 | — | 1 | — |
| Pneumonia..... | — | 10 | — | 13 | — | 21 |
| Polioomyelitis..... | 1 | — | — | — | — | — |
| Relapsing fever..... | — | — | — | — | 1 | — |
| Scarlet fever..... | 1 | — | 1 | — | 1 | — |
| Tuberculosis..... | — | 20 | — | 28 | — | 43 |
| Typhoid fever..... | 1 | 1 | 5 | — | 5 | 3 |
| Whooping cough..... | 11 | — | 11 | — | 18 | — |

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Aug. 25, 1933, pp. 1056-1068. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Sept. 20, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands—Cebu.—During the week ended September 2, 1933, 1 case of cholera with 1 death was reported in Cebu city, Philippine Islands.

Typhus Fever

Syria—Beirut.—During the week ended July 29, 1933, 2 cases of typhus fever were reported in Beirut, Syria.

Yellow Fever

Brazil.—Yellow fever has been reported in parts of Brazil as follows: Ceara State; Lavias, 1 case, 1 death, on June 14, 1933, St. Matheus, 1 case, 1 death, on June 19, 1933; Pernambuco State; Novo Exu, 2 cases, 2 deaths, from June 8–21, 1933, Salgueiro, 1 case 1 death, on June 1, 1933.

French West Africa—Niger Territory—Tahoua.—On August 21, 1933, 2 cases of yellow fever with 2 deaths were reported in Tahoua, Niger Territory, French West Africa.

X